

LAW OFFICES
SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC

2100 PENNSYLVANIA AVENUE, N.W.

WASHINGTON, DC 20037-3213

TELEPHONE (202) 293-7060

FACSIMILE (202) 293-7860

www.sughrue.com

April 13, 2001

09/807464
JC04 Rec'd PCT/PTO 13 APR 2001

BOX PCT

Commissioner for Patents
Washington, D.C. 20231

PCT/FR00/02292
-filed August 10, 2000

Re: Application of **Michel RUFFIN, Laurent CLEVY, Simone SEDILLOT, and Ramzi KAROU**

**A METHOD FOR THE ASYNCHRONOUS TRANSMISSION OF
INFORMATION IN ACCORDANCE WITH ACID PROPERTIES**

Our Ref: Q64056

Dear Sir:

The following documents and fees are submitted herewith in connection with the above application for the purpose of entering the National stage under 35 U.S.C. § 371 and in accordance with Chapter I of the Patent Cooperation Treaty:

- ☐ an executed Declaration and Power of Attorney.
- ☒ an English translation of the International Application.
- ☒ 1 sheet of drawings.
- ☐ an English translation of Article 19 claim amendments.
- ☐ an English translation of Article 34 amendments (annexes to the IPER).
- ☐ an executed Assignment and PTO 1595 form.
- ☐ a Form PTO-1449 listing the ISR references, and a complete copy of each reference.
- ☒ a Preliminary Amendment

The Declaration and Power of Attorney and Assignment with PTO Form 1595 will be submitted at a later date.

It is assumed that copies of the International Application, the International Search Report with Form PTO-1449 listing the International Search Report (ISR) references and a complete copy of each reference, the International Preliminary Examination Report, and any Articles 19 and 34 amendments as required by § 371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned can easily provide them upon request.

The Government filing fee is calculated as follows:

Total claims	6	-	20	=	0	x	\$18.00	=	\$0.00
Independent claims	2	-	3	=	0	x	\$80.00	=	\$0.00
Base Fee									\$860.00
TOTAL FEE									\$860.00

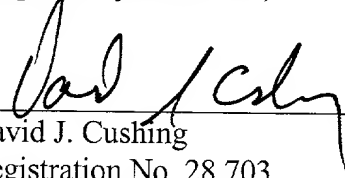
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Q64056 Entering the National Stage Under 35 U.S.C. § 371
April 13, 2001
Page 2

A check for the statutory filing fee of \$860.00 is attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.492 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Priority is claimed from August 16, 1999 based on French Application No. 9910516.

Respectfully submitted,


David J. Cushing
Registration No. 28,703

SUGHRUE, MION, ZINN,
MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, D.C. 20037-3213
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

Date: April 13, 2001

105390-49420860

09/807464

JC02 Rec'd PCT/PTO 13 APR 2001

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Michel RUFFIN, et al.

Attorney Docket Q64056

Appln. No.: not yet assigned

Group Art Unit: not yet assigned

Confirmation No.: not yet assigned

Examiner: not yet assigned

Filed: April 13, 2001

For: A METHOD FOR THE ASYNCHRONOUS TRANSMISSION OF INFORMATION IN
ACCORDANCE WITH ACID PROPERTIES

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

The specification is changed as follows:

Page 1, after the title, insert the heading

BACKGROUND OF THE INVENTION

Page 3, after line 7, insert the heading

SUMMARY OF THE INVENTION

Page 4, after line 4, insert the heading

BRIEF DESCRIPTION OF THE DRAWINGS

after line 10, insert the heading

DETAILED DESCRIPTION OF THE INVENTION

09/807464-0601

IN THE CLAIMS:

Please enter the following amended claims:

3. (Amended) A method according to claim 1, characterized in that to initiate said independent transactions said information is stored in queues each of which is associated with one of said clients and consumed by a thread.

5. (Amended) A communication channel according to claim 1, characterized in that it further includes queues each of which is associated with one of said clients.

6. (Amended) A transactional asynchronous communication architecture utilizing a plurality of communication channels according to claim 4.

IN THE ABSTRACT:

Please delete the present Abstract of the Disclosure and replace it with the following new Abstract of the Disclosure.

ABSTRACT

A method of transmitting information asynchronously between a supplier and a consumer in accordance with ACID properties, the supplier and the consumer being connected by a chain of communication channels. The method is characterized in that the information is transmitted by means of independent transactions set up: between the supplier and the first communication channel of the chain, between each of the communication channels of the chain, and between the last communication channel of the chain and the consumer.

TECHNICAL ABSTRACT


PRELIMINARY AMENDMENT
Attorney Docket Q64056

REMARKS

Entry and consideration of this Amendment are respectfully requested.

Respectfully submitted,

SUGHRUE, MION, ZINN,
MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, D.C. 20037-3213
Telephone: (202) 293-7060
Facsimile: (202) 293-7860



David J. Cushing
Registration No. 28,703

Date: April 13, 2001

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Page 1, after the title, insert the heading

BACKGROUND OF THE INVENTION

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SUMMARY OF THE INVENTION

Page 4, after line 4, insert the heading

BRIEF DESCRIPTION OF THE DRAWINGS

after line 10, insert the heading

DETAILED DESCRIPTION OF THE INVENTION

IN THE CLAIMS:

The claims are amended as follows:

3. (Amended) A method according to ~~the preceding claim 1~~, characterized in that to initiate said independent transactions said information is stored in queues each of which is associated with one of said clients and consumed by a thread.

5. (Amended) A communication channel according to ~~the preceding claim 1~~, characterized in that it further includes queues each of which is associated with one of said clients.

6. (Amended) A transactional asynchronous communication architecture utilizing a plurality of communication channels according to ~~either claim 4 or claim 5.~~

IN THE ABSTRACT OF DISCLOSURE:

The abstract is changed as follows:

ABSTRACT

A method of transmitting information asynchronously between a supplier and a consumer in accordance with ACID properties, the supplier and the consumer being connected by a chain of communication channels. The method is characterized in that the information is transmitted by means of independent transactions set up:

- between the supplier and the first communication channel of the chain,
- between each of the communication channels of the chain, and
- between the last communication channel of the chain and the consumer.

Figure for the abstract: ~~figure 1~~

A method for the asynchronous transmission of information in accordance with ACID properties.

5 The invention relates to the field of transmitting information between suppliers and consumers via a string of communication channels. The invention consists more particularly of effecting such transmission asynchronously in accordance with ACID properties.

10 Asynchronous transfer mode communication systems are used more and more widely. Reliable communications are necessary in a great number of situations. Reliability can be assured by adding transactional mechanisms to the communication service.

An asynchronous communication service includes a manager and one or more communication channels.

15 A supplier (service client) sends information on a specific channel. The channel transfers the information to the consumer (also a service client) by invoking its interface. The channel acts as an intermediary between two clients and decouples the transmission of information at both ends. It must be able to deliver the information reliably and maintain the desynchronization of suppliers and consumers.

20 A prior art solution to the problem of transmitting data reliably is based on transactional systems. A transaction is initiated by a supplier of data and is then "propagated" to intermediate elements (communication channels) and eventually reaches a consumer. Once the data has been delivered, properties associated with the execution of the transaction are verified before confirming the modifications effected (i.e. the delivery of the data).

25 It must be possible for the execution of transactions to propagate via a communication channel. Asynchronous communication channels imply desynchronization of suppliers and consumers but transactions necessitate synchronization to enable the stability properties of the transactions to be monitored from end to end of execution.

30 A transaction must satisfy four properties grouped together under the acronym ACID: Atomicity, Coherence, Isolation and Durability. These four properties are closely interrelated. The objective of competition and restart control mechanisms executed by a transactional engine is to ensure compliance with them.

35 Atomicity guarantees that all the updates of a transaction are effected or none of them. Failure to comply with this property can change the set of data from a

09/807464

coherent initial state to an incoherent state.

To comply with this property, any series of actions constituting a transaction is marked by a beginning and an end. The beginning of a transaction reports the start event of a transaction to the transactional engine. Two instructions are provided for marking the end of a transaction: "commit" enables the transaction to report to the transactional monitor that from the point of view of the transaction alone all of its actions have succeeded, and "abort" enables the transaction to report to the transactional monitor that one or more of its actions have failed and that the transaction does not wish to be validated (the data modified by the transaction must be returned to its preceding state). Depending on the event received by the transactional monitor at the end of the transaction, and on any overview of the system that it may have (interaction between transactions), the transactional monitor decides whether to validate the transaction, i.e. whether to finalize the modifications effected by it. If a system fault occurs before the end of a transaction the transaction is considered to be aborted. One mechanism for ensuring compliance with the atomicity property consists of retaining for each transaction in progress the preceding image of any data updated. If a transaction is aborted, it is possible to undo the transaction by applying all the preceding images of the transaction.

The coherence property concerns the semantic coherence of a set of data. This can be preserved in part by mechanisms that monitor integrity constraints and by maintaining the property [lacuna] of the transactions.

Isolation is indispensable in a multitasking environment to guarantee that each transaction sees a coherent state of the set of data. Isolation consists of guaranteeing that if the transaction is executed in parallel with other transactions accessing a common data set there is a serial execution of the same transactions that would produce the same changes on the data set accessed by the transactions. In this case, the isolation property is verified for that set of transactions.

Durability guarantees that the updates of a validated transaction are final. The only action that can permit the updates of a validated transaction to be undone is the execution of a compensation transaction. This property goes hand-in-hand with the atomicity property stipulating that the updates of a transaction form a coherent whole which is either aborted as a whole or validated permanently. A restart mechanism can be provided to recover information lost in the event of a memory fault or disk fault leading to the loss of some of the information from the database.

Reliable end-to-end asynchronous communication mechanisms are required.

It is difficult to combine the asynchronous aspect of the transfer with transactions which are essentially synchronous.

In a synchronous system, a transaction can be initiated and guarantee compliance with ACID properties from the information supplier to the consumer. In an asynchronous system the actions that guarantee these properties must interact with each other in a particular and reliable way, depending on the required quality of service.

The object of the invention is therefore to provide an asynchronous communication system having ACID properties.

The invention therefore provides a method of transmitting information asynchronously between a supplier and a consumer in accordance with ACID properties, the supplier and the consumer being connected by a chain of communication channels, characterized in that the information is transmitted by means of independent transactions set up:

- between the supplier and the first communication channel of the chain,
- between each of the communication channels of the chain, and
- between the last communication channel of the chain and the consumer.

The invention also provides a communication channel enabling asynchronous transmission of information between a supplier and a consumer in accordance with ACID properties, the channel having a set of clients which can be other communication channels and/or consumers, characterized in that it includes:

- means for storing the information contained in a transaction for which the channel is the target,
- means for finalizing the transaction, and
- means for initiating transactions containing the information with the clients if the transaction has succeeded.

The minimum number of transactions can be undone in the event of a problem because independent transactions are initiated for each link of the chain. This obviously achieves good performance in terms of the time to deliver the information to the consumer.

Also, the supplier initiates a transaction with only the first communication channel of the chain. The result of that transaction ("commit" or "abort") will therefore be obtained very quickly, and the supplier will not be blocked pending delivery of the information to the consumer. In other words, the objective of asynchronous transmission is achieved.

Delivery of the information to the consumer in compliance with ACID properties is ensured because all the intermediate transmissions are effected by means of transactions. In other words, it might be said that there is a "virtual transaction" between the supplier and the consumer.

5 The following detailed description of one embodiment of the invention explains the invention.

Figure 1 shows the general principle of a chain of transactions in accordance with the invention.

10 Figure 2 shows one example of a communication network using communication channels in accordance with the invention.

15 In figure 1, the suppliers, the asynchronous communication channel and the consumers are objects virtually connected into a unidirectional information propagation chain. As explained in more detail below, the chain can include a plurality of communication channels in cascade between the supplier and the consumers.

20 A transaction is initiated by a supplier 1 and is addressed to a communication channel 2. The transaction includes at least the information that the supplier wishes to transmit to the consumers 5.

25 The communication channel then stores the information in a reliable memory 4. The reliable memory can conventionally be a database which has an XA interface and the necessary restart mechanisms.

30 The transaction that was initiated by the supplier 1 is then finalized. If finalization succeeds (which conventionally corresponds to sending a "commit" message to the supplier), the information contained in the transaction is stored in queues 6. There is one queue for each client of the channel. A client of the channel can be a consumer, as in this example, or another communication channel. Thus in the figure 1 example there are two queues, each associated with one of the two consumers 5.

35 In one embodiment of the invention the information is stored in the queues before the transaction is finalized, but is not made available (for example by means of an availability identifier associated with each queue) until finalization has succeeded.

Note that more than one supplier can invoke the same communication channel 2 in parallel. This is made technically possible by using more than one thread.

Similarly, there is more than one thread for each consumer virtually connected to the channel. The role of the threads is to consume the information stored in the queues 6 in order to initiate transactions with the clients of the communication channel. Those clients can be consumers 5 or, obviously, other communication channels.

The transactions contain the information stored in the queues and previously received from the supplier 1. Thus the information is transmitted along the chain.

The clients (here the consumers 5) then finalize the transactions. If the transactions succeed, the communication channel receives in return a message ("commit") advising it of this. In this case, the information stored in the queue 6 corresponding to the client that transmitted the "commit" is withdrawn.

Note that in this case the reliable memory is never accessed in read mode. Because the reliable memory is typically a database, it is clear that any access to it represents a penalty in terms of execution speed. The above method therefore minimizes access to the reliable memory by using much faster queues and consequently increases the speed at which information is transmitted from the supplier to the consumers.

In one embodiment of the invention each software element (supplier, communication channel, consumers) provides a standard recovery interface for restarting in the event of a fault. That interface enables the action performed by a transaction that has failed to be undone. Similarly, the reliable memory provides an interface mainly enabling information associated with a transaction to be withdrawn from storage. Accordingly, if one of the transactions in the chain fails, all of the actions undertaken on the objects implicated by the transaction in question are undone.

Once the actions have been undone because of the failure of a transaction, the transaction can be restarted by reading the information stored in the reliable memory.

As stated above, if a transaction fails, it can be undone and restarted without calling into question the other transactions previously effected in the chain.

If the state of a channel, i.e. the content of the queues and the knowledge of its virtual interconnections, is lost, the reliable memories enable it to be restored.

The above solution provides an end-to-end data recovery mechanism working automatically with an external transactional system. Compared to other solutions, the mechanism is generic.

The foregoing description considers only one communication channel, but the mechanism is symmetrical and works in the same way in any chain of channels. In other words, there can be any number of communication channels between the supplier and the consumer or consumers. As previously indicated, in this situation a communication channel can be connected as a client of another communication channel.

Figure 2 shows one example of a network of communication channels. A supplier F_1 is connected to a first communication channel. A supplier F_2 is connected to a second communication channel. These two communication channels have a third communication channel as a client. One or more consumers C_1 are connected as clients of the first communication channel and one or more consumers C_2 are connected as clients of the second communication channel.

The above kind of network topology is highly beneficial in practice. It enables consumers C_1 to receive only information from suppliers F_1 and consumers C_2 to receive information from suppliers F_1 and F_2 . Any software entity can therefore choose to receive information from more than one supplier by choosing the communication channel to which it must connect as a client.

Claims

1. A method of transmitting information asynchronously between a supplier and a consumer in accordance with ACID properties, said supplier and said consumer being connected by a chain of communication channels, characterized in that said information is transmitted by means of independent transactions set up:

- between said supplier and the first communication channel of said chain,
- between each of the communication channels of said chain, and
- between the last communication channel of said chain and said consumer.

2. A method according to claim 1, characterized in that each communication channel has a set of clients which can be other communication channels and/or consumers, and in that when a communication channel of said chain is the target of one of said independent transactions, it effects the following steps:

- storing said information in a reliable memory,
- finalizing said independent transaction, and
- if said independent transaction has succeeded, initiating independent transactions with said clients containing said information.

3. A method according to the preceding claim, characterized in that to initiate said independent transactions said information is stored in queues each of which is associated with one of said clients and consumed by a thread.

4. A communication channel enabling asynchronous transmission of information between a supplier and a consumer in accordance with ACID properties, said channel having a set of clients which can be other communication channels and/or consumers, characterized in that it includes:

- means for storing the information contained in a transaction for which said channel is the target,
- means for finalizing said transaction, and
- means for initiating transactions containing said information with said clients if said transaction has succeeded.

5. A communication channel according to the preceding claim, characterized in that it further includes queues each of which is associated with one of said clients.

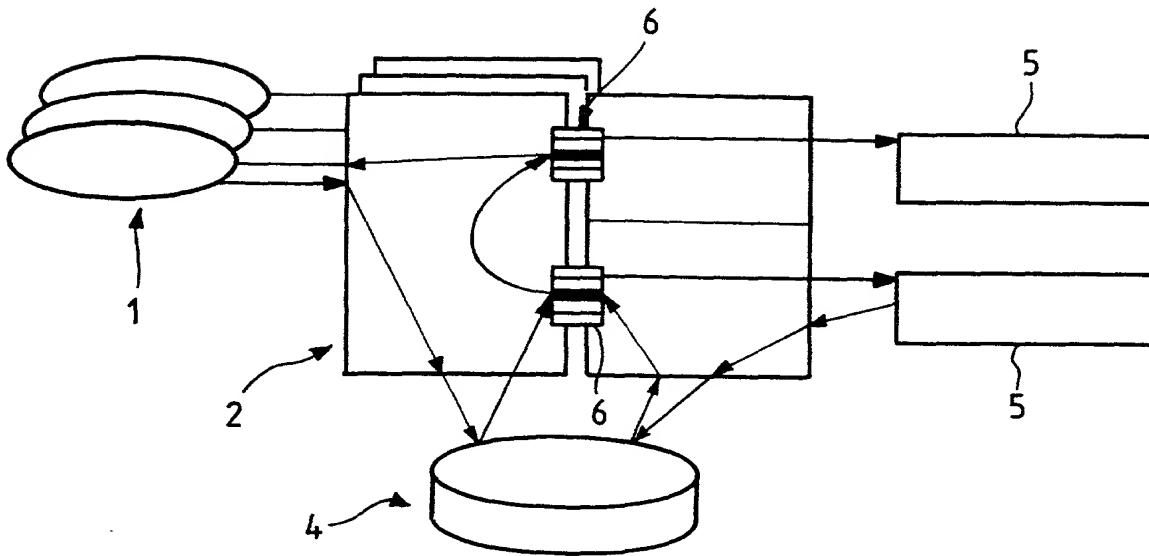
6. A transactional asynchronous communication architecture utilizing a plurality of communication channels according to either claim 4 or claim 5.

ABSTRACT

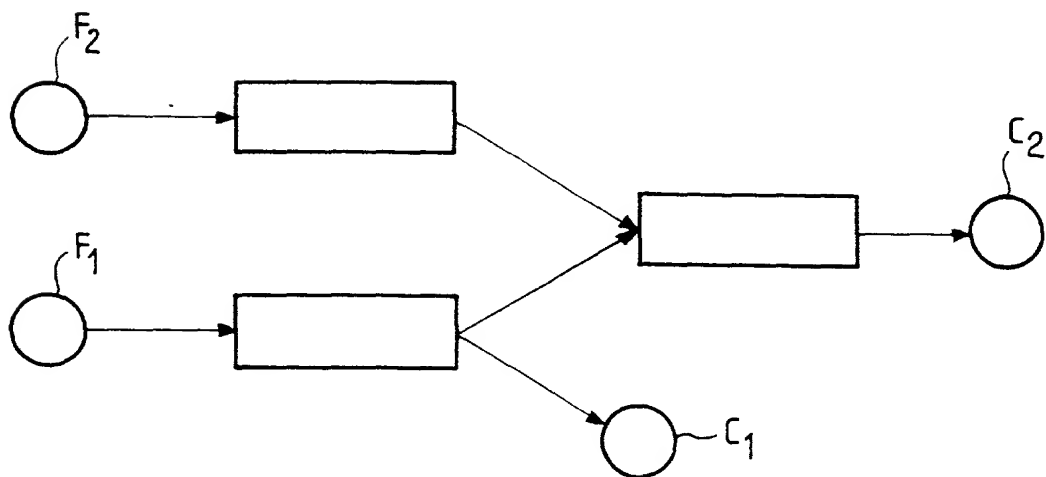
- A method of transmitting information asynchronously between a supplier and a consumer in accordance with ACID properties, the supplier and the consumer being connected by a chain of communication channels. The method is characterized in that the information is transmitted by means of independent transactions set up:
- between the supplier and the first communication channel of the chain,
 - between each of the communication channels of the chain, and
 - between the last communication channel of the chain and the consumer.

Figure for the abstract : figure 1

FIG_1



FIG_2



French Language Declaration

Entry into a US national phase for an International Application PCT/FR00/02292 filed on 10 August 2000

Declaration and Power of Attorney for Patent Application

Déclaration et Pouvoirs pour Demande de Brevet

French Language Declaration

En tant que l'inventeur nommé ci-après, je déclare par le présent acte que:

As a below named inventor, I hereby declare that:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

My residence, post office address and citizenship are as stated next to my name.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention de la description identifiée par le numéro de référence

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention in the specification identified by Docket No.

102797/SYC/XEXTEEND

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below, and have also identified below any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior foreign application(s) for which priority is claimed

Demande(s) de brevet étrangère(s) antérieure(s) dont la priorité est revendiquée

(Number) (Numéro)	(Country) (Pays)	(Day/Month/Year Filed) (Jour/Mois/Année de dépôt)
99 10 516	FRANCE	16 AUGUST 1999

Prior foreign applications for which priority is not claimed

Demande(s) de brevet étrangères antérieure(s) dont la priorité n'est pas revendiquée

(Number) (Numéro)	(Country) (Pays)	(Day/Month/Year Filed) (Jour/Mois/Année de dépôt)

French Language Declaration

Entry into a US national phase for an International Application PCT/FR00/02292 filed on 10 August 2000

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application No.)
(No de demande)

(Filing Date)
(Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont j'ai pu disposer entre la date de dépôt de la demande antérieure et la date de dépôt de la demande nationale ou internationale PCT de la présente demande.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application No.)
(NO de demande)

(Filing Date)
(Date de dépôt)

(Status)(patented, pending, abandoned)
(Statut)(breveté, en cours d'examen, abandonné)

Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la Section 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

French Language Declaration

Entry into a US national phase for an International Application PCT/FR00/02292 filed on 10 August 2000

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec l'Office des brevets et des marques: (mentionner le nom et le numéro d'enregistrement).

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)

John H. Mion, Reg. No. 18,879; Thomas J. Macpeak, Reg. No. 19,292; Robert J. Seas, Jr., Reg. No. 21,092; Darryl Mexic, Reg. No. 23,063; Robert V. Sloan, Reg. No. 22,775; Peter D. Olexy, Reg. No. 24,513; J. Frank Osha, Reg. No. 24,625; Waddell A. Biggart, Reg. No. 24,861; Louis Gubinsky, Reg. No. 24,835; Neil B. Siegel, Reg. No. 25,200; David J. Cushing, Reg. No. 28,703; John R. Inge, Reg. No. 26,916; Joseph J. Ruch, Jr., Reg. No. 26,577; Sheldon I. Landsman, Reg. No. 25,430; Richard C. Turner, Reg. No. 29,710; Howard L. Bernstein, Reg. No. 25,665; Alan J. Kasper, Reg. No. 25,426; Kenneth J. Burchfiel, Reg. No. 31,333; Gordon Kit, Reg. No. 30,764; Susan J. Mack, Reg. No. 30,951; Frank L. Bernstein, Reg. No. 31,484; Mark Boland, Reg. No. 32,197; William H. Mandir, Reg. No. 32,156; Scott M. Daniels, Reg. No. 32,562; Brian W. Hannon, Reg. No. 32,778; Abraham J. Rosner, Reg. No. 33,276; Bruce E. Kramer, Reg. No. 33,725; Paul F. Neils, Reg. No. 33,102; and Brett S. Sylvester, Reg. No. 32,765; and Robert M. Masters, Reg. No. 35,603.

Adresser toute correspondance à:

Send Correspondence to:
SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W., Suite 800
Washington, D.C. 20037-3213

Nom complet de l'unique ou premier inventeur	1-00	Full name of sole or first inventor (First Middle Last)	Michel RUFFIN
Signature de l'inventeur	Date	Inventor's signature	Date 19/04/2001
Domicile		Residence	75003 PARIS, FRANCE FRX
Nationalité		Citizenship	French
Adresse postale		Post Office Address	14, rue des Haudriettes 75003 PARIS, FRANCE
Nom complet du second co-inventeur, le cas échéant	2-00	Full name of second joint inventor, if any (First Middle Last)	Laurent CLEVY
Signature du second inventeur	Date	Second inventor's signature	Date 23/04/2001
Domicile		Residence	28000 CHARTRES, FRANCE FRX
Nationalité		Citizenship	French
Adresse postale		Post Office Address	14, rue Rémi Belleau 28000 CHARTRES FRANCE

(Fournir les mêmes renseignements et la signature de tout co-inventeur supplémentaire.)

(Supply similar information and signature for third and subsequent joint inventors.)

French Language Declaration

Entry into a US national phase for an International Application PCT/FR00/02292 filed on 10 August 2000

Nom complet du troisième co-inventeur, le cas échéant <i>3-00</i>	Full name of third joint inventor, if any (First Middle Last) <u>Simone SEDILLOT</u>
Signature du troisième l'inventeur Date	Third inventor's signature <i>S. Sedillot</i> Date <i>15 MAI 2001</i>
Domicile	Residence 78140 <u>VELIZY</u> FRANCE <i>FRX</i>
Nationalité	Citizenship French
Adresse postale	Post Office Address 1 rue Jules Guesde 78140 VELIZY FRANCE
Nom complet du quatrième co-inventeur, le cas échéant <i>4-00</i>	Full name of fourth joint inventor, if any (First Middle Last) <u>Ramzi KAROUI</u>
Signature du quatrième l'inventeur Date	Fourth inventor's signature <i>R. Karoui</i> Date <i>15 MAI 2001</i>
Domicile	Residence 92260 <u>FONTENAY AUX ROSES</u> FRANCE <i>FRX</i>
Nationalité	Citizenship
Adresse postale	Post Office Address 14 Rue Jean-Pierre Laurens 92260 FONTENAY AUX ROSES FRANCE
Nom complet du cinquième co-inventeur, le cas échéant	Full name of fifth joint inventor, if any (First Middle Last)
Signature du cinquième l'inventeur Date	Fifth inventor's signature Date
Domicile	Residence
Nationalité	Citizenship
Adresse postale	Post Office Address
Nom complet du sixième co-inventeur, le cas échéant	Full name of sixth joint inventor, if any (First Middle Last)
Signature du sixième l'inventeur Date	Sixth inventor's signature Date
Domicile	Residence
Nationalité	Citizenship
Adresse postale	Post Office Address